

JOE SEIDEL

MATH CAMP 2016 EXERCISES

Exercise 1

Is the set $X = \{(x, y) \in \mathbb{R}^2 \mid xy < 1\}$ convex?

Choose $\mathbf{x} = (a, 0)$ and $\mathbf{y} = (0, a)$, where $a > 1$. Then $\mathbf{x}, \mathbf{y} \in X$, but $z = (\lambda a, (1 - \lambda)a) \notin X$. Therefore, X is not convex.